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End of Result Set

[signature: Hendricks]

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L7: Entry 2 of 2   File: USPT   Aug 19, 1997

DOCUMENT-IDENTIFIER: US 5659350 A
** See image for Certificate of Correction **
TITLE: Operations center for a television program packaging and delivery system

Detailed Description Text (74):
Certain metrics are established to help in evaluating the data. Using the EIS or
similar software, sales by menu placement, cost, category and lifespan can be pulled
up for viewing in graphic presentation. The graphic presentation, in the form of
line or bar graphs, help the packager recognize any trends in the data. For example,
the first movie on a movie menu might not have sold as well as a second movie
listed. A chart can be pulled up to reveal that the first movie has been at the top
of the menu for two weeks and buy rates are naturally falling off. Steps can then be
taken to move items in the menus to correct this, though many of these steps are
automated in the menu creation system. Suggested changes can be displayed to help
the user in this task.

CLAIMS:

27. A method for generating a program control information signal for near video on
demand service using programs wherein the near video on demand service is
transmitted from a central location for distribution to subscribers, comprising:

designating a program to be available to subscribers more than once during a day;

evaluating the length of the designated program;

creating program start times using the evaluated length of the program;

organizing a program line-up with the designated program and the program start times
so that the program appears in the program line-up more than once and wherein more
than one designated program is in the program line-up;

generating the program control information signal using the organized program line
up for transmission.

30. A method for creating near video on demand service using programs wherein the
near video on demand service is transmitted from a central location for distribution
to subscribers, comprising the steps of:

designating a program to be available to subscribers more than once;

evaluating the length of the designated program;

creating program start times using the evaluated length of the program;

organizing a program line-up using the program start times so that the program
appears in the program line-up more than once;

generating a program control information signal using the organized program line-up;

transmitting the program control information signal and the designated program to subscribers, wherein the designated program is transmitted to subscribers at the designated program's start times.

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End of Result Set

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L44: Entry 1 of 1   File: USPT   Jul 10, 2001

DOCUMENT-IDENTIFIER: US 6260024 B1
TITLE: Method and apparatus for facilitating buyer-driven purchase orders on a
commercial network system

US Patent No. (1):
6260024

Detailed Description Text (54):
Data storage device 360 is a conventional magnetic-based hard disk storage unit such
as those manufactured by Conner Peripherals or Maxtor. Message database 370 may be
used for archiving seller bids 115, while audit database 380 may be used for
recording payment records and communications with central controller 200.

Detailed Description Text (67):
If all is well, the FPO is accepted at step 630. At step 640 a unique tacking number
is added to the FPO 100. The central controller 200 time-stamps FPO 100 at step 650
sets the status to "active" and stores FPO 100 in the FPO database 265. FPO database
265 contains a record for the FPO 100 and a record for each item in the FPO 100. The
FPO record contains fields such as status, tracking number, time-stamp and buyer ID.
The status field has values of "pending," "active," "expired," and "completed." A
status of "pending", means that the FPO cannot currently be added into a PPO.
Either, central controller 100 is still processing it, or the buyer has temporarily
suspended it, or it is part of a multiple step signing key. An "active" FPO 100 is
available to be added to a PPO. An "expired" FPO 100 can no longer be used. FPO 100
that have been bid and sold by a seller have a status of "completed." A record for
an item of in FPO 100 has fields such item ID, a FPO tracking number, quantity,
ceiling price and other conditions added by the buyer.

Detailed Description Text (70):
Referring again to FIG. 7 the items of the FPO 100 are extracted from the FPO 100 at
step 680. At step 690 these items are posted to the PPO database 267. The PPO
database contains a record for each PPO 110 and a record for each item in the PPO.
The PPO record contains fields such as status, tracking number, time-stamp, pool
date and category. The status field has values of "pending," "active," "expired,"
and "completed." A status of "pending", means that the PPO cannot currently be bid
on by a seller. Either, central controller 100 is still processing it, or it has
been closed to bidding. An "active" PPO 110 is available to be bid on by potential
sellers. An "expired" PPO 110 can no longer be bid on. PPO 110 that have been bid
and sold by a seller have a status of "completed." A record for an item of in PPO
110 has fields such item ID, a FPO tracking number, quantity, ceiling price and
other conditions added by the buyer.

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L13: Entry 3 of 6   File: USPT   May 1, 2001

DOCUMENT-IDENTIFIER: US 6226794 B1
TITLE: Set top terminal for an interactive information distribution system

Brief Summary Text (7):
The disadvantages heretofore associated with the prior art are overcome by the
present invention. The present invention is a set top terminal for receiving
information transmitted from a service provider, for receiving control information
transmitted by a service provider, and for transmitting control information from the
set top terminal to the service provider to interactively control the services that
are being received. More specifically, the set top terminal receives in-band
information from the service provider, e.g., menu images, data, video, audio, and
the like, in a frequency band of 50-750 MHz. The control information transmitted by
the set top terminal is carried in a frequency band of 15.5 to 29.5 MHz. As such,
the set top terminal communicates using three independent communications channels:
(a) an information channel; (2) a command channel; and (3) a back channel. The back
channel information is modulated by the set top terminal using a binary phase shift
key (BPSK) modulator. The command channel of control information received by the set
top terminal from the network is transmitted using quadrature phase shift key (QPSK)
modulation. The broadband information carried by the information channel is
modulated using either quadrature amplitude modulation (QAM) or a conventional
analog modulated television signal modulation scheme such as NTSC, PAL, or SECAM.
Prior to being modulated into a carrier frequency, both the command channel data and
the information channel data are packetized using a transport protocol such as the
Moving Pictures Experts Group transport protocol, a modified version of this
protocol, or some other protocol that facilitates packet addressing and routing.

Detailed Description Text (3):
FIG. 1 depicts a block diagram of the set top terminal 100 of the present invention.
The set top terminal contains an input port 102 that is coupled to a conventional
cable or hybrid fiber-cable coax network (not shown). This network carries an
information channel, a command channel, and a back channel. The information channel
carries both analog signals (e.g., conventional cable television signals) and
digital signals (e.g., interactive television signals). Specifically, at the distal
end of the network is a interactive information service provider equipment that
provides requested information and analog television signal via the information
channel as well as command and control information for the set top terminal on the
command channel. The service provider equipment also accepts requests and commands
from the set top terminal transmitted via the back channel. The back channel
information is generally carried using a frequency within the band 15.5 to 29.5 MHz.
The command channel information is generally carried on a carrier in the 70 to 110
MHz band, but can be transmitted on any frequency in the 50-750 MHz band. The
information channel occupies the band from 50 to 750 MHz. All these channels are
propagated through a single network using frequency multiplexing.

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L12: Entry 3 of 6   File: PGPB   Jan 2, 2003

DOCUMENT-IDENTIFIER: US 20030005439 A1
TITLE: Subscriber television system user interface with a virtual reality media space

Summary of Invention Paragraph (4):
[0002] The explosion of technology in the world of communications and computing has enabled an amazing trend in the systems that people use for enjoyment, interaction, and communication. The trend involves recreating the environment in which we live. This has been made possible by the advancement of the technology that drives communication and computing. This general trend of reality based computer interaction is evident in most areas of advancing technology. Recent advancements in processing power and transmission capability have made it possible to take one giant step closer to recreating a realistic setting in a computer enabled system.

Detail Description Paragraph (21):
[0040] FIG. 4 is a diagram that illustrates an alternative embodiment of the VR-MS-UI 100 (FIG. 1A) to the user interface depicted in FIG. 2 and FIG. 3. In FIG. 4 the user navigates the 3D world by causing the avatar to walk around. As mentioned previously, an avatar is an icon that represents a user in an application. In FIG. 4 we see that Avatar One 410 takes the shape of a woman. In this application, one particular user is represented by Avatar One 410 and that user's actions are implemented by that avatar. The discretion of the user can determine whether the viewpoint will be from the eyes of the avatar character or an "over the shoulder" viewpoint of her avatar. In any manner, VR-MS-UI 100B allows the user to cause Avatar One 410 to walk around the landscape. The 3D World given by VR-MS-UI 100B is an area where a user can walk along and watch events on the Media Wall 430. As shown in FIG. 4, the Media Wall 430 displays numerous media events. The user can take part in viewing these media events simply by walking along the Media Wall 430 and bringing a certain event into view within the user interface. An alternative embodiment might allow the user to walk up to a media event and select a certain event to be shown in full screen mode, similar to a normal television display. In FIG. 4 we can see that Avatar One 410 has wandered up to Media Event 440 and is watching the Live Sports event that is being displayed. If the user controlling Avatar One 410 desires to view something else, then that user can simply continue to stroll down the extensive Media Wall 430 and find an event of interest. The Media Wall 430 can contain video streams from numerous television channels, interactive program guides, videos on demand, web pages, advertisements or any other type of media. In a non-limiting example, a Client Device containing multiple tuners could show several small billboards simultaneously displaying currently tuned TV channels that could be selected by the user for full screen viewing. In an alternative implementation, a Client Device with one tuner could tune to a frequency containing a signal with multiple lower bandwidth TV channels concatenated into that one signal. In this manner, the Client Device might simultaneously display multiple TV channels on multiple billboards of a lower bandwidth.

CLAIMS:

15. The method of claim 12, wherein the 2D user interface is an interactive program guide displaying programming information for the STS client device.

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DOCUMENT-IDENTIFIER: US 6185360 B1
TITLE: Information receiving system and method

Detailed Description Text (23):
In the memory control means 23h, if it is detected that overlapping of recording
time occurs in plural reserved programs, the comparing and determining means 23g
reads out the service additional information of "Baseball: ABC vs. XYZ" and "Movie:
Jurassic Land" stored in the first memory unit 25, and compares them, and determines
which program to record in the overlapped time (step 14). The service additional
information may be considered to include, for example, information about data size
of program, viewing fee of program or tariff information of the program, information
about whether the program distribution time is fixed or not, that is, whether the
program is video on-demand or near video on-demand or single distribution only,
information whether program is a series piece or a single piece, and many other
various information. The comparing and determining means 23g of the information
receiving apparatus of embodiment 1 of the invention compared specific information
out of the information contained in the service additional information of each
program, and determines which program to record, out of plural programs overlapped
in the recording time on the basis of a specific criterion. Such specific
information may be preset by the user through the external signal input unit 22.

Detailed Description Text (35):
Concerning the information to be compared out of the service additional information,
a slightly specific description is given about an example of the information
relating whether the program distribution time is fixed or not, that is, whether the
program is video on-demand or near video on-demand or a single distribution only. In
this case, the comparing and determining means 23g selects to record which one of
the plural programs overlapped in recording time, for example, as follows. That is,
if detecting one of the overlapped programs is fixed in distribution time, that is,
a single distribution alone, and the other is near video on-demand or video
on-demand, the program of the fixed distribution time is reserved for recording by
priority, and as for the near video on- demand or video-on demand program, it is
determined to change the recording time to reserve to record in other
non-overlapping time. At this time, even in the case of the program fixed in
distribution time, if repeat broadcasting is scheduled in advance and the
information of repeat broadcasting such as channel and date of repeat broadcasting
is included in the service additional information, such program may be handled same
as the near video on-demand or video on-demand program.

Detailed Description Text (46):
Thus, using the viewing trend survey means 30, when the recording time of plural
programs is overlapped, the comparing and determining means 23g compares the genre
information in the service additional information of each program with the viewer's
viewing trend information recorded in the viewing trend survey means 30, and
determines the program same as or similar to the viewing trend of the user as the
program to be recorded.

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DOCUMENT-IDENTIFIER: US 6539548 B1
TITLE: Operations center for a television program packaging and delivery system

Parent Case Text (2):
This application is a continuation of Ser. No. 08/160,282 filed Dec. 2, 1993 which
is a continuation-in-part of application Ser. No. 07/991,074, filed Dec. 9, 1992,
entitled TELEVISION PROGRAM PACKAGING AND DELIVERY SYSTEM WITH MENU DRIVEN
SUBSCRIBER ACCESS. The following other continuation-in-part applications, also based
on the above-referenced patent application, are incorporated herein by reference:
Ser. No. 08/160,281, filed Dec. 2, 1993, entitled REPROGRAMMABLE TERMINAL FOR
SUGGESTING PROGRAMS OFFERED ON A TELEVISION PROGRAM DELIVERY SYSTEM Ser. No.
08/160,280, filed Dec. 2, 1993, entitled NETWORK CONTROLLER FOR CABLE TELEVISION
DELIVERY SYSTEMS Ser. No. 08/160,193, filed Dec. 2, 1993, entitled SET-TOP TERMINAL
FOR CABLE TELEVISION DELIVERY SYSTEMS Ser. No. 08/160,194, filed Dec. 2, 1993,
entitled ADVANCED SET-TOP TERMINAL FOR CABLE TELEVISION DELIVERY SYSTEMS Ser. No.
08/160,283, filed Dec. 2, 1993, entitled DIGITAL CABLE HEADEND FOR CABLE TELEVISION
DELIVERY SYSTEM

Brief Summary Text (31):
The Operations Center of the present invention provides a method for remote
management and control of local cable and CATV programs available and on-screen menu
displays shown to subscribers. The Operations Center's computer software programs
and hardware provide "real-time" control over cable and CATV systems. By
transmitting appropriate control information the Operations Center has the ability
to change allocation of programs across physical channels, update menu information
(from the Operations Center location), reprogram menu formats and menu flow, and
change or augment a packaged program signal sent to a particular region of the
country. The Operations Center is able to control remotely certain features and
software of the set top terminals and if necessary reprogram menu display software
stored at the set top terminals.

Brief Summary Text (32):
In order to properly manage program lineups, the Operations Center acquires viewer
information on programs watched. Such viewer information includes information about
the buy rates of specific shows, viewer preferences for programming, and the like,
gathered by recording viewer transactions. A compilation of viewer information data
is needed in order to make decisions on future individualized program lineup and
program packaging. In addition, allocation of menu space and construction of menus
is aided by the use of viewer information data. This information is received from
the set top terminals using a feedback loop, usually through the cable headends.

Brief Summary Text (41):
It is an object of this invention to provide an Operations Center that can control
and if necessary reprogram set top terminals.

Drawing Description Text (21):
FIG. 19 is a drawing of a broadcast television menu screen to be displayed on a set
top terminal.

Drawing Description Text (22):
FIG. 20 is a drawing of a hit movie menu screen to be displayed on a set top
terminal.

Drawing Description Text (23):
FIG. 21 is a drawing of a hit movie description menu screen to be displayed on a <u>set</u>
<u>top terminal</u>.

Drawing Description Text (24):
FIG. 22 is a flow chart of the progression of primary menus in the menu driven
system of the <u>set top terminal</u>.

Detailed Description Text (7):
In its most basic form, the system uses a program delivery system 200 in conjunction
with a conventional concatenated cable television system 210. The program delivery
system 200 generally includes (i) at least one operations center 202, where program
packaging and control information are created and then assembled in the form of
digital data, (ii) a digital compression system, where the digital data is
compressed, combined/multiplexed, encoded, and mapped into digital signals for
satellite transmission to the cable headend 208, and (iii) a set of in-home
decompressors. The program delivery system 200 transports the digital signals to the
cable headend 208 where the signals are transmitted through a concatenated cable
television system 210. Within the cable headend 208, the received signals may be
decoded, demultiplexed, managed by a local central distribution and switching
mechanism, combined and then transmitted to the <u>set top terminal</u> 220 located in each
subscriber's home over the cable system 210. Although concatenated cable systems 210
are the most prevalent transmission media to the home, telephone lines, cellular
networks, fiberoptics, Personal Communication Networks and similar technology for
transmitting to the home can be used interchangeably with this program delivery
system 200.

Detailed Description Text (8):
The delivery system 200 has a reception region 207 with an in-home decompression
capability. This capability is performed by a decompressor housed within a <u>set top</u>
<u>terminal</u> 220 in each subscriber's home. The decompressor remains transparent from
the subscriber's point of view and allows any of the compressed signals to be
demultiplexed and individually extracted from the composite data stream and then
individually decompressed upon selection by the subscriber. The decompressed video
signals are converted into analog signals for television display. Such analog
signals include NTSC formatted signals for use by a standard television. Control
signals are likewise extracted and decompressed and then either executed immediately
or placed in local storage such as a RAM. Multiple sets of decompression hardware
may be used to decompress video and control signals. The <u>set top terminal</u> 220 may
then overlay or combine different signals to form the desired display on the
subscriber's television. Graphics on video or picture-on-picture are examples of
such a display.

Detailed Description Text (9):
Although a single digital compression standard (e.g., MPEG) may be used for both the
program delivery system 200 and the concatenated cable system 210, the compression
technique used may differ between the two systems. When the compression standards
differ between the two media, the signals received by the cable headend 208 must be
decompressed before transmission from the headend 208 to the <u>set top terminals</u> 220.
Subsequently, the cable headend 208 must recompress and transmit the signals to the
<u>set top terminal</u> 220, which would then decompress the signals using a specific
decompression algorithm.

Detailed Description Text (10):
The video signals and program control signals received by the <u>set top terminal</u> 220
correspond to specific television programs and menu selections that each subscriber
may access through a subscriber interface. The subscriber interface is a device with
buttons located on the <u>set top terminal</u> 220 or on a portable remote control 900. In
the preferred system embodiment, the subscriber interface is a combined
alpha-character, numeric and iconic remote control device 900, which provides direct
or menu-driven program access. The preferred subscriber interface also contains
cursor movement and go buttons as well as alpha, numeric and iconic buttons. This
subscriber interface and menu arrangement enables the subscriber to sequence through
menus by choosing from among several menu options that are displayed on the

television screen. In addition, a user may bypass several menu screens and immediately choose a program by selecting the appropriate alpha-character, numeric or iconic combinations on the subscriber interface. In the preferred embodiment, the set top terminal 220 generates the menus that are displayed on the television by creating arrays of particular menu templates, and the set top terminal 220 displays a specific menu or submenu option for each available video signal.

Detailed Description Text (14):
The packaging process also accounts for any groupings by satellite transponder which are necessary. The operations center 202 may send different groups of programs to different cable headends 208 and/or set top terminals 220. One way the operations center 202 may accomplish this task is to send different program packages to each transponder. Each transponder, or set of transponders, then relays a specific program package to specific cable headends 208 and/or set top terminals 220. The allocation of transponder space is an important task performed by the operations center 202.

Detailed Description Text (15):
The operations center 202 may also "insert" directions for filling local available program time in the packaged signal to enable local cable and television companies to fill the program time with local advertising and/or local programming. Consequently, the local cable headends 208 are not constrained to show only programs transmitted from the operations center 202. New set top converters will incorporate both digital and analog channels. Therefore, the cable headend 208 may combine analog signals with the digital signals prior to transmitting the program signals to the set top terminals 220.

Detailed Description Text (16):
After the CAP packages the programs, it creates a program control information signal to be delivered with the program package to the cable headend 208 and/or set top terminal 220. The program control information signal contains a description of the contents of the program package, commands to be sent to the cable headend 208 and/or set top terminal 220, and other information relevant to the signal transmission.

Detailed Description Text (21):
After the operations center 202 has compressed and encoded the program signals and transmitted the signals to the satellite, the cable headend 208 receives and further processes the signals before they are relayed to each set top terminal 220. Each cable headend site is generally equipped with multiple satellite receiver dishes. Each dish is capable of handling multiple transponder signals from a single satellite and sometimes from multiple satellites.

Detailed Description Text (22):
With reference to FIG. 3, as an intermediary between the set top terminals 220 and the operations center 202 and master control uplink site 211 (or other remote site), the cable headend 208 performs two primary functions. First, the cable headend 208 acts as a distribution center, or signal processor, by relaying the program signal to the set top terminal 220 in each subscriber's home. In addition, the cable headend 208 acts as a network controller 214 by receiving information from each set top terminal 220 and passing such information on to an information gathering site such as the operations center 202.

Detailed Description Text (24):
As a signal processor 209, the cable headend 208 prepares the program signals that are received by the cable headend 208 for transmission to each set top terminal 220. In the preferred system, the signal processor 209 re-routes or demultiplexes and recombines the signals and digital information received from the operations center 202 and allocates different portions of the signal to different frequency ranges. Cable headends 208 which offer different subscribers different program offerings may allocate the program signals from the operations center 202 in various manners to accommodate different viewers. The signal processor 209 may also incorporate local programming and/or local advertisements into the program signal and forward the revised signal to the set top terminals 220. To accommodate this local programming availability, the signal processor 209 must combine the local signal in digital or analog form with the operations center program signals. If the local cable system

uses a compression standard that is different than the one used by the operations
center 202, the signal processor 209 must also decompress and recompress incoming
signals so they may be properly formatted for transmission to the set top terminals
220. This process becomes less important as standards develop (i.e., MPEG 2). In
addition, the signal processor 209 performs any necessary signal decryption and/or
encryption.

Detailed Description Text (25):
As a network controller 214, the cable headend 208 performs the system control
functions for the system. The primary function of the network controller 214 is to
manage the configuration of the set top terminals 220 and process signals received
from the set top terminals 220. In the preferred embodiment, the network controller
214 monitors, among other things, automatic poll-back responses from the set top
terminals 220 remotely located at each subscribers' home. The polling and automatic
report-back cycle occurs frequently enough to allow the network controller 214 to
maintain accurate account and billing information as well as monitor authorized
channel access. In the simplest embodiment, information to be sent to the network
controller 214 will be stored in RAM within each subscriber's set top terminal 220
and will be retrieved only upon polling by the network controller 214. Retrieval
may, for example, occur on a daily, weekly or monthly basis. The network controller
214 allows the system to maintain complete information on all programs watched using
a particular set top terminal 220.

Detailed Description Text (26):
The network controller 214 is also able to respond to the immediate needs of a set
top terminal 220 by modifying a program control information signal received from the
operations center 202. Therefore, the network controller 214 enables the delivery
system to adapt to the specific requirements of individual set top terminals 220
when the requirements cannot be provided to the operations center 202 in advance. In
other words, the network controller 214 is able to perform "on the fly programming"
changes. With this capability, the network controller 214 can handle sophisticated
local programming needs such as, for example, interactive television services, split
screen video, and selection of different foreign languages for the same video. In
addition, the network controller 214 controls and monitors all compressors and
decompressors in the system.

Detailed Description Text (27):
The delivery system 200 and digital compression of the preferred embodiment provides
a one-way path from the operations center 202 to the cable headend 208. Status and
billing information is sent from the set top terminal 220 to the network controller
214 at the cable headend 208 and not directly to the operations center 202. Thus,
program monitoring and selection control will take place only at the cable headend
208 by the local cable company and its decentralized network controllers 214 (i.e.,
decentralized relative to the operations center 202, which is central to the program
delivery system 200). The local cable company will in turn be in communication with
the operations center 202 or a regional control center (not shown) which accumulates
return data from the set top terminal 220 for statistical or billing purposes. In
alternative system embodiments, the operations center 202 and the statistical and
billing sites are collocated. Further, telephone lines with modems are used to
transfer information from the set top terminal 220 to the statistical and billing
sites.

Detailed Description Text (28):
5. Set Top Terminal

Detailed Description Text (29):
The set top terminal 220 is the portion of the delivery system 200 that resides in
the home of a subscriber. The set top terminal 220 is usually located above or below
the subscriber's television, but it may be placed anywhere in or near the
subscriber's home as long as it is within the range of the subscriber's remote
control device 900. In some aspects, the set top terminal 220 may resemble converter
boxes already used by many cable systems. For instance, each set top terminal 220
may include a variety of error detection, decryption, and coding techniques such as
anti-taping encoding. However, it will become apparent from the discussion below
that the set top terminal 220 is able to perform many functions that an ordinary

converter box cannot perform.

Detailed Description Text (30):
The set top terminal 220 has a plurality of input and output ports to enable it to communicate with other local and remote devices. The set top terminal 220 has an input port that receives information from the cable headend 208. In addition, the unit has at least two output ports which provide communications from the set top terminal 220 to a television and a VCR Certain menu selections may cause the set top terminal 220 to send control signals directly to the VCR to automatically program or operate the VCR. Also, the set top terminal 220 contains a phone Jack which can be used for maintenance, trouble shooting, reprogramming and additional customer features. The set top terminal 220 may also contain stereo/audio output terminals and a satellite dish input port.

Detailed Description Text (31):
Functionally, the set top terminal 220 is the last component in the delivery system chain. The set top terminal 220 receives compressed program and control signals from the cable headend 208 (or, in some cases, directly from the operations center 202). After the set top terminal 220 receives the individually compressed program and control signals, the signals are demultiplexed, decompressed, converted to analog signals (if necessary) and either placed in local storage (from which the menu template may be created), executed immediately, or sent directly to the television screen.

Detailed Description Text (32):
After processing certain signals received from the cable headend 208, the set top terminal 220 is able to store menu templates for creating menus that are displayed on a subscriber's television by using an array of menu templates. Before a menu can be constructed, menu templates must be created and sent to the set top terminal 220 for storage. A microprocessor uses the control signals received from the operations center 202 or cable headend 208 to generate the menu templates for storage. Each menu template may be stored in volatile memory in the set top terminal 220. When the set top terminal receives template information it demultiplexes the program control signals received from the cable headend 208 into four primary parts: video, graphics, program logic and text. Each menu template represents a different portion of a whole menu, such as a menu background, television logo, cursor highlight overlay, or other miscellaneous components needed to build a menu. The menu templates may be deleted or altered using control signals received from the operations center 202 or cable headend 208.

Detailed Description Text (33):
Once the menu templates have been stored in memory, the set top terminal 220 can generate the appropriate menus. In the preferred embodiment, the basic menu format information is stored in memory located within the set top terminal 220 so that the microprocessor may locally access the information from the set top terminal instead of from an incoming signal. The microprocessor next generates the appropriate menus from the menu templates and the other menu information stored in memory. The set top terminal 220 then displays specific menus on the subscriber's television screen that correspond to the inputs the subscriber selects.

Detailed Description Text (34):
If the subscriber selects a specific program from a menu, the set top terminal 220 determines on which channel the program is being shown, demultiplexes and extracts the single channel transmitted from the cable headend 208. The set top terminal 220 then decompresses the channel and, if necessary, converts the program signal to an analog NTSC signal to enable the subscriber to view the selected program. The set top terminal 220 can be equipped to decompress more than one program signal, but this would unnecessarily add to the cost of the unit since a subscriber will generally only view one program at a time. However, two or three decompressors may be desirable to provide picture-on-picture capability, control signal decompression, enhanced channel switching or like features.

Detailed Description Text (35):
In addition to menu information, the set top terminal 220 may also store text transmitted from the cable headend 208 or the operations center 202. The text may

inform the subscriber about upcoming events, billing and account status, new
subscriptions, or other relevant information. The text will be stored in an
appropriate memory location depending on the frequency and the duration of the use
of the textual message.

Detailed Description Text (36):
Also, optional upgrades are available to enhance the performance of a subscriber's
set top terminal 220. These upgrades may consist of a cartridge or computer card
(not shown) that is inserted into an expansion slot in the set top terminal 220 or
may consist of a feature offered by the cable headend 208 or operations center 202
to which the user may subscribe. Available upgrades may include on line data base
services, interactive multi-media services, access to digital radio channels, and
other services.

Detailed Description Text (37):
In the simplest embodiment, available converter boxes such as those manufactured by
General Instruments or Scientific Atlanta, may be modified and upgraded to perform
the functions of a set top terminal 220. The preferred upgrade is a circuit card
with a microprocessor which is electronically connected to or inserted into the
converter box.

Detailed Description Text (39):
The primary conduit for communication between the subscriber and the set top
terminal 220 is through the subscriber interface, preferably a remote control device
900. Through this interface, the subscriber may select desired programming through
the system's menu-driven scheme or by directly accessing a specific channel by
entering the actual channel number. Using the interface, the subscriber can navigate
through a series of informative program selection menus. By using menu-driven,
iconic or alpha-character access, the subscriber can access desired programs by
simply pressing a single button rather than recalling from memory and pressing the
actual channel number to make a selection. The subscriber can access regular
broadcast and basic cable television stations by using either the numeric keys on
the remote control 900 (pressing the corresponding channel number), or one of the
menu icon selection options.

Detailed Description Text (44):
Immediately after the subscriber turns on the set top terminal 220, the Introductory
menu welcomes the subscriber to the system. The Introductory menu may display
important announcements from the local cable franchise, advertisements from the
cable provider, or other types of messages. In addition, the Introductory menu can
inform the subscriber if the cable headend 208 has sent a personal message to the
subscriber's particular set top terminal 220.

Detailed Description Text (48):
The During program menus (including Hidden Menus and Program Overlay Menus) are
displayed by the set top terminal 220 only after the subscriber has selected a
television program. In order to avoid disturbing the subscriber, the set top
terminal 220 does not display the Hidden Menus until the subscriber selects the
appropriate option to display a Hidden Menu. The Hidden Menus contain options that
are relevant to the program selected by the viewer. For example, a Hidden Menu may
contain options that enable a subscriber to enter an interactive mode or escape from
the selected program.

Detailed Description Text (63):
An integral part of the Computer Assisting Packaging system is the retrieval of
viewer data, and the assimilation of that data into the program packaging method
(especially the menu configuration) as discussed in reference to FIG. 8 MII 402.
This involves two main steps, first, retrieval of raw data from the set top
terminals, and then filtering and presenting that data. Each headend 208 compiles
the viewer data, and then sends it verbatim to the Operations Center 202. This raw
data is necessary because different responsibilities of the Operations Center 202
require different parts of the raw information. Also a record must be kept of
overall data. Once the data is assembled at the Operations Center 202, the data is
filtered for each application.

Detailed Description Text (68):
Certain metrics are established to help in evaluating the data. Using the EIS or similar software, sales by menu placement, cost, category and lifespan can be pulled up for viewing in graphic presentation. The graphic presentation, in the form of line or bar graphs, help the packager recognize any trends in the data. For example, the first movie on a movie menu might not have sold as well as a second movie listed. A chart can be pulled up to reveal that the first movie has been at the top of the menu for two weeks and buy rates are naturally falling off. Steps can then be taken to move items in the menus to correct this, though many of these steps are automated in the menu creation system. Suggested changes can be displayed to help the user in this task.

Detailed Description Text (70):
Another use for the indexed data is creation of marketing reports. Programming changes are helped by accurate information on viewer preference. Also viewer purchasing trends, and regional interests can be tracked.

Detailed Description Text (81):
The following table, TABLE A, is an example of some information that can be sent in the program control information signal to the set top terminals 220. The program control information signal generated by the Operations Center 202 provides data on the scheduling and description of programs via the network controller 214 or, in an alternate configuration, directly to the set top terminal 220 for display to the subscriber.

Detailed Description Text (82):
In the preferred embodiment, the program control information signal 276 is stored and modified by the network controller 214 and sent to the set top terminal 220 in the form of a set top terminal control information stream (STTCIS). This configuration accommodates differences in individual cable systems and possible differences in set top converter or terminal devices. The set top terminal 220 of the present invention integrates either the program control signal 276 or the STTCIS, together with data stored in the memory of the set top terminal 220, to generate on-screen menu displays for assisting the subscriber in choosing programs for viewing. throughout the description the term "program control information" is being used to indicate control information coming from the cable headend 208 to the set top terminal 220, whether it is sent directly from the Operations Center 202, processed by the network controller 214, and then forwarded to the set top terminal as STTCIS, or transmitted over telephone lines.)

Detailed Description Text (84):
The goal of the menu driven program selection system of the present invention, described in greater detail in a co-pending U.S. Patent application entitled SET TOP TERMINAL FOR CABLE TELEVISION DELIVERY SYSTEM, Ser. No. 08/160,193, filed Dec. 2, 1993, owned by the assignee of the present invention and incorporated herein by reference, is to allow the subscriber to choose a program by touring through a series of menus utilizing a remote control 900 for cursor movement. The final choice in the series of menus will identify one particular channel and one time for activation of that channel. Armed with a channel and activation time the set top terminal 220 can display the selected program on the television for the viewer. To achieve this goal, an intelligent alpha-numeric code is assigned to each program. This alpha-numeric code identifies the category of the program, the menu in which the program should be displayed, its transmission time(s), and the position on the menu that the program should be displayed. In a preferred embodiment, the program control information, including menu codes, is sent continuously from the Operations Center 202 to the network controller 214, and ultimately to the set top terminal 220. For example, four hours worth of programming information can be sent via the program control information signal continuously in the format shown in TABLE A.

Detailed Description Text (85):
TABLE A shows the basic information that is needed by the set top terminal 220. The program descriptions shown are coded abbreviations. For example, C stands for comedy, N for news, S for sports, A for cartoons, and TX for text. If there is a textual description for a program, such as a movie, the description may be given following that program's coded description or may be communicated following the four

hours of programming information. As is shown in the coded listing, program
descriptions for programs greater than a half hour in length need not be repeated
(each half hour). The video description code informs the set top terminal 220
whether there is still or live video available to advertise the program.

Detailed Description Text (87):
In the 12:30 Channel 1 entry of TABLE A, two menu codes are shown. By allowing two
menu codes, programs that may fit under two different category descriptions may be
shown in both menus to the subscriber. With this minimal amount of information being
communicated to the set top terminal 220 on a regular basis, the terminal is able to
determine the proper menu location for each program and the proper time and channel
to activate for the subscriber after his menu selection. In the preferred
embodiment, the menu codes are generated at the Operations Center 202.

Detailed Description Text (88):
Table B shows an example Events Table that may be downloaded to a set top terminal
220 using the Event Data file which contains information about events and pricing.
As shown in the table, the three columns of the Events Table identify the field
number, the field itself and the type of information downloaded in the Event Data
file. The first column contains the field numbers 1 through 11. The middle column
contains the corresponding field parameters, including the event type, event ID,
global channel ID, price, start time, end time, start date, end date, P- icon, name
and description. The third column contains corresponding field type information. As
shown in this field type information typically consists of an unsigned integer;
hours, minutes and seconds; months, day and year; and ASCII character identifier.

Detailed Description Text (90):
The program control information signal 276 and STTCIS can be formatted in a variety
of ways and the on-screen menus can be produced in many different ways. For
instance, if the program control information signal 276 carries no menu format
information, the menu format for creating the menus can be fixed in ROM at the set
top terminal 220. This method allows the program control signal 276 to carry less
information but has the least flexibility since the menu formats cannot be changed
without physically swapping the ROM holding the menu format information. In the
preferred embodiment, the menu format information is stored at the set top terminal
220 in temporary memory either in a RAM or EPROM. This configuration provides the
desired flexibility in the menu format while still limiting the amount of
information needed to be communicated via the program control information signal
276. New menu format information would be sent via the program control information
signal 276 or the STTCIS to the set top terminals 220 each time there was a change
to a menu.

Detailed Description Text (91):
In the simplest embodiment, the menus remain fixed and only the text changes. Thus,
the program control information signal 276 can be limited to primarily text and a
text generator can be employed in the set top terminal 220. This simple embodiment
keeps the cost of the set top terminal 220 low and limits the bandwidth necessary
for the program control information. Another simple embodiment uses a separate
channel full-time (large bandwidth) just for the menu information.

Detailed Description Text (92):
FIGS. 6a and 6b, particularly FIG. 6a, show a data format 920 at the bit-level for
one embodiment of a program information signal 276. This frame format consists of
six fields, namely: (1) a leading flag 922 at the beginning of the message, (2) an
address field 924, (3) a subscriber region designation 926, (4) a set top terminal
identifier 928 that includes a polling command/response (or P/F) bit 930, (5) an
information field 932, and (6) a trailing flag 934 at the end of the message.

Detailed Description Text (93):
The eight-bit flag sequence that appears at the beginning 922 and end 927 of a frame
is used to establish and maintain synchronization. Such a sequence typically
consists of a "01111110" bit-stream. The address field 924 designates a 4-bit
address for a given set top terminal 220. The subscriber region designation 926 is a
4-bit field that indicates the geographical region in which the subscriber's set top
terminal 220 is housed. The set top terminal identifier 928 is a 16-bit field that

uniquely identifies each set top terminal 220 with a 15-bit designation followed by
an appended P/F bit 930. Although field size is provided by this example, a variety
of sizes can be used with the present invention.

Detailed Description Text (94):
The P/F bit 930 is used to command a polling response 920' (FIG. 6b) from the set
top terminal 220 addressed. The polling response 920' is substantially similar to
the from format 920, and is commonly numbered, but with a prime (') designation
appended for clarity. The frame format 920 also provides a variable-length
information field 932 for other data transmissions, such as information on system
updates. The frame format ends with an 8-bit flag 934 (or trailing flag) that is
identical in format to the leading flag 922, as set forth above. Other frame
formats, such as MPEG, for example, will be apparent to one skilled in the art and
can be easily adapted for use with the system.

Detailed Description Text (100):
The Marketing Information Interface (MII) 402 subroutine interfaces the processing
and editing subroutines with marketing data. This interface regularly receives
programs watched information from billing sites 420, cable headends 208, or set top
terminals 220. In addition, other marketing information 422 such as the demographics
of viewers during certain time periods may be received by the MII 402. The MII 402
also uses algorithms 424 to analyze the program watched information and marketing
data 420, 422, and provides the analyzed information to the processing and editing
subroutines. In the preferred embodiment, an Executive Information System (EIS) with
a yield management subsystem is included in the MII subroutine as described above.

Detailed Description Text (101):
The Cable Franchise Information Access (CFIA) 404 subroutine receives information on
cable franchises, as represented at block 426, such as the particular equipment used
in a cable headend 208, the number of set top terminals 220 within a cable
franchise, groupings of set top terminals 220 on concatenated cable systems 210,
distribution of "high-end" cable subscribers, etc. The CFIA 404 generates a cable
franchise control signal 428 which is integrated with the program control
information 276 output to generate cable headend 208 specific information to be
transmitted. The integration algorithm for accomplishing this resides within the
Generator subroutine described herein below.

Detailed Description Text (140):
The SERVICE Database file 503 contains service records with each record representing
an available service. A service may be thought of as a virtual video channel.
Virtual channels are non-existent channels which are mapped or created by hardware
and software and is described in co-pending patent application Ser. No. 08/160,194,
filed Dec. 2, 1998, entitled ADVANCED SET TOP TERMINAL FOR A CABLE TELEVISION
DELIVERY SYSTEM, incorporated herein by reference. Services are then mapped into
local headend channels. Since initial distribution of video source material may be
by "Federal Express" instead of a video channel, a service ID is used to identify
the virtual channel being used for the desired service. "60 Minutes" could be
distributed and then be mapped into any desired local headend channel. The service
database exists at both the national site and at each local headend 208. Every
service has a name, call letters and a description of the service. Every service
also has an assigned local channel, "A" tape (or CD) machine ID and "B" tape (or CD)
machine ID. Note that these last three parameters only apply to the service
databases at the local headends 208. The local headend service database performs an
equivalent function of a "channel map." For a further description of the cable
headend function, see co-pending patent application Ser. No. 08/160,280, filed Dec.
2, 1993, entitled NETWORK CONTROLLER FOR A CABLE TELEVISION DELIVERY SYSTEM, filed
by the same assignee.

Detailed Description Text (167):
Mini pays 310 are channels to which existing set top converter boxes (not shown) and
the set top terminals 220 of the present invention may subscribe. The subscriptions
for mini pays 310 may be daily, weekly, or monthly. An example would be the Science
Fiction channel. Data services 312 are services in which information is
interactively presented to the subscriber using a modem or other high rate of speed
data transfer. Some examples are Prodigy, services for airline reservations, and TV

guide services (e.g. TV Guide X*PRESS.TM., InSight.TM., etc.). Data could also
include classified or other forms of advertising.

Detailed Description Text (170):
The CAP 260 uses an interactive algorithm 416 to allocate transponder space 320 and
set prices 322. The factors weighed by the algorithm are: 1. buy rates of the
program, 2. margin of profit on the program, 3. length of the program, 4. any
contractual requirement which overrides other factors (such as requirement to run a
specific football game live in its entirety). The information on buy rates of the
program may be obtained by the Marketing Information Interface 400 from a Central
Statistical and Billing Site, a Regional Statistical and Billing Site, the cable
headend 208 or directly from the set top terminals 220 as will be described later.
The CAP 260 must consider the priority levels of programming (e.g., FIG. 16) when
allocating transponder space. Particularly, as in the preferred embodiment,
transponders are assigned to three specific priority levels. The CAP may
automatically (without packager intervention) access the MII 400 and the EIS to
obtain necessary decision making information on transponder allocation.

Detailed Description Text (176):
The During program menus 1200 are enacted by the set top terminal 220 only after the
subscriber has selected a television program. These menus provide the subscriber
with additional functionality and/or additional information while he is viewing a
selected program. The During program menus 1200 sequence can be further subdivided
into at least two types of menus, Hidden Menus 1380 and Program Overlay Menus 1390.

Detailed Description Text (177):
To avoid disturbing a subscriber during viewing of a program, the Hidden Menus 1380
are not shown to the subscriber but instead "reside" at the set top terminal 220
microprocessor. The Hidden Menus 1380 do not effect the selected program audio. The
microprocessor awaits a button entry either from the remote 900 or set top terminal
220 buttons before executing or displaying any Hidden Menu options. The Hidden Menus
1380 provide the subscriber with additional functions such as entering an
interactive mode or escaping from a selected program.

Detailed Description Text (179):
All menu entries may be made either from buttons available on the top cover of the
set top terminal 220 or from the remote 900.

Detailed Description Text (181):
For example, the major menu 1020 for children's programming provides a list of
subcategories 1052 from which the subscriber selects. Upon selection of a
subcategory a submenu 1054, 1056 listing program choices within that sub-category is
shown to the subscriber. Upon selection of a particular programming choice within
the first submenu 1050, the subscriber is then provided with a second submenu 1058
describing the program that the subscriber has selected. From this menu, the
subscriber may now confirm his program choice and receive a confirmation submenu
1060 from the set top terminal 220 software.

Detailed Description Text (182):
Since the system utilizes digital signals in compressed format, High Definition
Television programming can also be accommodated through the menu system. In
addition, since the set top terminal 220 has two way communication with the cable
headend, interactive television programming is possible, with return signals
generated by the set top terminal 220. Similarly, the system can support "movies on
demand" where a subscriber communicates through the set top terminal 220 with an
automated facility to order movies stored at the facility.

Detailed Description Text (183):
Using this on-screen menu approach to program selection, there is nearly an
unlimited number of menus that can be shown to the subscriber. The memory capability
of the set top terminal 220 and the quantity of information that is sent via the
program control information signal are the only limits on the number of menus and
amount of information that can be displayed to the subscriber. The approach of using
a series of menus in a simple tree sequence is both easy for the subscriber to use
and simply implemented by the set top terminal 220 and remote control device 900

with cursor movement. A user interface software programmer will find many obvious
variations from the preferred embodiment shown.

Detailed Description Text (186):
In the preferred embodiment, the subscriber is given the capability of accessing
base channels such as regular broadcast TV and standard cable channels directly from
the introductory menu 1000 by entering the channel number. The subscriber is also
given the capability of directly accessing his account with the cable company.
Further, in the preferred embodiment, the subscriber may directly access a major
menu 1020 and bypass the home menu screen 1010. If the subscriber is familiar with
the programming choices available on the major menus 1020, he may select an icon
button 960, or a lettered key (alpha key) from his remote control 900 and directly
access the desired major menu 1020. If any key entry other than those expected by
the set top terminal 220 software program is made, the home menu 1010 is placed on
the television screen. In addition, after a period of time if no selections are made
from the introductory menu 1000, the program may default to the home menu screen
1010.

Detailed Description Text (187):
FIGS. 25a, 25b, 25c, and 25d are examples of home menus 1010 that may be used in the
set top terminal 220 software. FIGS. 25a-25d all employ multiple window techniques
to make the menu user friendly and offer a significant number of choices. It is
preferred that a channel line up and the major menu 1020 categories both appear on
the home menu 1010.

Detailed Description Text (190):
FIG. 25b shows an embodiment in which only eight major menus 1020 are utilized. By
pressing the alpha-numeric or icon key 960 corresponding to the category of programs
the subscriber desires, the appropriate major menu 1020 is accessed. In addition,
the subscriber may employ an on-screen cursor to select any option shown in the
menu. To move the cursor, the subscriber may use either the cursor movement keys on
the remote control 900 or similar keys located at the top of the set top terminal
220.

Detailed Description Text (197):
In FIG. 27b, the left upper window 1002 displays current time and the right upper
window 1004 displays a message. This menu provides a list of eight movie titles and
their rating 1009. If the subscriber desires further information on any particular
movie he may select a movie using the cursor movement buttons and press the "go"
button on the remote control 900 or set top terminal 220 box.

Detailed Description Text (204):
FIGS. 29a and 29b are notification submenus informing the user that his program
selection is about to begin (e.g., counting down until start time). Using this
submenu, the set top terminal 220 warns the user prior to switching him away from
the channel he is viewing to a prior selected program channel. This notification
submenu is provided to the subscriber approximately one or more minutes before the
set top terminal 220 changes the viewing channel.

Detailed Description Text (207):
Using a notification submenu 1127, the set top terminal 220 may allow a subscriber
to view other programs prior to his movie start time. The subscriber is amply
notified of the start time of his program and effortlessly moved to the correct
channel to view his selected program. This notification-type submenu may be used to
move a subscriber from his current channel to any preselected channel for viewing a
program which has been ordered at an earlier time. In the preferred embodiment, the
amount of time provided by the notification submenu may be customized by the
subscriber to a length of his preference. The notification submenu also allows a
subscriber to cancel or escape from his previously selected program choice and avoid
any charges. If a subscriber cancels or escapes he is returned to the channel that
he is currently watching.

Detailed Description Text (220):
In the preferred embodiment, TV guide services, listing programs available on
network schedules, will be available on a major menu, as shown in FIG. 32a. In the

preferred embodiment, the major TV guide menu 1036 would offer submenus, such as network schedules for the next seven days, today's network schedules for the next six hours, and TV guide picks for the next seven days. If the particular <u>set top terminal</u> 220 has been subscribed to the TV guide service, the subscriber may proceed to a submenu showing schedules of programs. If the subscriber chooses the network schedule submenu 1236, he is offered a list of network schedules to choose from as shown in FIG. 32b. If a subscriber were to choose, for instance, HBO, the submenu 1238 shown in FIG. 32c would appear. This submenu allows a subscriber to choose the program date that interests him. Following selection of a date, the subscriber is shown a more specific submenu 1242 listing programs available on the particular date as shown in 32d.

Detailed Description Text (221):
Following a program choice, a program description submenu 1244 is placed on the television screen as shown in FIG. 32e. In addition, from this program description submenu, the viewer may choose to record the selected program on his VCR using the guide record feature. If the guide record feature is chosen, the guide record submenu 1248 shown in FIG. 32f provides the subscriber with further instructions. In order for the <u>set top terminal</u> 220 to perform the guide record functions and operate the VCR, control signals must be sent from the <u>set top terminal</u> 220 to the VCR via the video connection 650 or via a separate connection between the <u>set top terminal</u> 220 and the VCR. The VCR must be capable of interpreting these control signals from the <u>set top terminal</u> 220 and performing the desired function (such as, activating the record feature). In the preferred embodiment, the VCR control signals are sent with the video signal and output from the output 650, as described above.

Detailed Description Text (224):
Following a subcategory selection on the broadcast TV menu such as favorite channels, the <u>set top terminal</u> 220 will display a submenu of programs as shown in FIG. 32h. The favorite channel program menu 1256 of FIG. 32h allows the subscriber to choose among eight programs in progress at 9:45 p.m. on a broadcast TV network.

Detailed Description Text (225):
Using this methodology, the subscriber may also be allowed to choose among television programs which will be available for viewing in the next half hour or hour. When the time of the preselected program is approaching, the <u>set top terminal</u> 220 will display a notification menu or window to the subscriber (similar to FIG. 29a and 29b) informing him of an eminent change of channels to a previously selected program.

Detailed Description Text (227):
Once a personal profile has been created (in a particular <u>set top terminal</u> 220), it can be indefinitely stored in nonvolatile memory. A selection at the home menu screen 1010 activates the program selection feature. Following activation of the feature, the <u>set top terminal</u> 220 will present the viewer with a series of brief questions to determine the viewer's mood at that particular time. For example, the first mood question screen 1260 may ask the viewer to select whether he desires a short (30 minute), medium (30-60 minute), or long (60 plus minute) program selection, as shown in FIG. 32i. The second mood question screen 1262 requests the viewer to select between a serious program, a thoughtful program, or a light program, as shown in FIG. 32j. And the third mood question screen 1264 requests whether the user desires a passive program or an active program, as shown in FIG. 32k. The viewer makes his selection in each question menu utilizing the cursor movement keys and "go" button on his remote control 900. A variety of other mood questions are possible such as fatigue level of the viewer.

Detailed Description Text (228):
After the viewer has responded to the mood question menus which determine his mood, the <u>set top terminal</u> 220 finds the best programming matches for the viewer and displays an offering of several suggested programs to the viewer (three or more programs are preferred). The matching algorithm compares the viewer profile data with information about the program derived from the program control information (or STTCIS) signal, such as show category, description type, length, etc. Using the personal profile information and mood questions suggested above, the following types of outcomes are possible. If the <u>set top terminal</u> 220 is presented with a young lady

viewer, educated in Boston who watches sitcoms on a regular basis, and desires a short, light, passive program, a match might be found with the 30-minute sitcom Cheers, the sitcom Designing Women, and Murphy Brown. Taking another example, a middle-aged male viewer from the Boston area, wishing a longer length, light, passive program suggestion might be suggested the New England Patriots game, the Boston Red Sox game and a science fiction movie.

Detailed Description Text (229):
With this program selection feature, the set top terminal 220 can intelligently assist the specific viewer in selecting a television program. Instead of the set top terminal 220 requiring an input of personal profile information, the terminal may also "learn" a subscriber's viewing habits by maintaining historical data on the types of programs the viewer has most frequently watched. This information can then be fed to the matching algorithm which selects the suggested television programs.

Detailed Description Text (230):
Using this methodology, it is even possible for the set top terminal 220 to suggest programs for two viewers. By using two sets of viewer profile information, the matching algorithm can find the best match for joint viewing. For example, the set top terminal 220 can suggest programs for a couple watching television simultaneously.

Detailed Description Text (232):
FIGS. 33a, 33b, and 33c demonstrate the use of promotional menus to sell subscriptions to services in the system. In particular, FIG. 33a is a promotional menu 1304 for Level A interactive services. Level A interactive services offers subscribers additional information about programs such as quizzes, geographical facts, etc. This information may be received by the set top terminal 220 in several data formats including VBI and in the program control information signal. FIG. 33b is a promotional menu 1306 for Level B interactive services which include a variety of on-line type services such as Prodigy, Yellow Pages, Airline Reservations, etc.

Detailed Description Text (235):
FIGS. 33d through 33j show menus that are available using the interactive Level A services. When interactive Levels A services are available in a television program, the system will display the interactive logo consisting of the letter "I" and two arrows with semicircular tails. In the preferred embodiment the set top terminal 220 will place the interactive logo on the television screen as an overlay menu 1310. In the preferred embodiment, the set top terminal 220 will detect that there is data or information available about a television program which can be displayed to a subscriber using the interactive service. When the set top terminal 220 senses that there is interactive information available, it will generate the interactive logo overlay menu and place it on the television screen. For example, the set top terminal 220 will detect that information on a television program is being sent in the vertical blanking interval (VBI) and generate an interactive logo overlay menu which will appear on the subscriber's television screen for approximately fifteen seconds during each ten minute interval of programming.

Detailed Description Text (236):
When the subscriber sees the interactive logo on his television screen, he is made aware of the fact that interactive services are available in conjunction with his television program. If the subscriber presses his interactive remote control button, an additional overlay menu will be generated by the set top terminal 220 and placed on the screen. This menu 1310 is shown in FIG. 33d being overlayed on an interactive television program. From this menu the subscriber may select interactive features or return to the television program without interactive features.

Detailed Description Text (239):
FIG. 33f shows an interactive fast facts submenu 1314. In this submenu textual information is given to the subscriber in the lower half of his screen. This textual information will change as additional data is received by the set top terminal 220 relating to this television program.

Detailed Description Text (240):
FIG. 33g shows the use of the subcategory "more information" in the interactive

service. This submenu 1316 gives additional information related to the television program to the viewer in textual form in the lower half of the screen. FIG. 33h is an interactive submenu 1318 for the subcategory "quiz." In this interactive subcategory, the user is presented with questions and a series of possible answers. If the subscriber desires, he selects one of the answers to the quiz question. After his selection, the set top terminal 220 sequences to another menu. The set top terminal 220 sequences to the interactive quiz answers submenu which informs the subscriber whether he has chosen the correct answer or not. FIG. 33i shows a correctly answered quiz question 1320 and FIG. 33j shows an incorrectly answered quiz question 1324. In the preferred embodiment, the menu graphics for both of these menus 33i and 33j is the same. The only difference is in the text which can be generated by the text generator of the set top terminal 220.

Detailed Description Text (254):
The digital/audio feature of the invention allows a subscriber to listen to CD quality audio selections through his stereo. This can be accomplished by running cables directly from the set top terminal 220 to the subscriber's amplifier/stereo system. Alternatively, the user may listen to audio selections through his television system.

Detailed Description Text (258):
FIGS. 36a, 36b and 37a, 37b relate to the monthly account review capabilities available to the subscriber. In the preferred embodiment, the subscriber may choose to access the monthly account review capability from both the introductory menu 1000 and home menu 1010. The monthly account review screen shows alternative window types that are available to the set top terminal 220. For example, in the upper left-hand corner of the monthly account review, the current time and date are both shown. The upper right-hand corner provides the subscriber with instructions on how to use the monthly account review capability. FIG. 36b also shows that windows may be created in a variety of shapes. For instance, on the lower right-hand part of the screen 1612 two triangularly shaped windows with messages are shown. In addition, on the left lower part of the screen 1612 a window in the shape of a trapezoid is shown with a textual message inside.

Detailed Description Text (262):
The account information necessary to create the monthly account review menus may be stored either in the memory of the set top terminal 220 or at a remote location that communicates with the set top terminal 220. In the simplest embodiment, the set top terminal 220 records a subscriber's selections locally and calculates the monthly account review based upon the subscriber's selections which require the payment of fees. This monthly account information is stored locally and sent to the cable headend 208 at least once a month for back-up and billing purposes.

Detailed Description Text (263):
Alternatively, the subscriber's viewing selections and billing information may be continuously maintained at the cable headend 208 or a remote site connected via communication lines to the cable headend 208. The cable headend 208 or the remote site must regularly transmit the monthly account information to the set top terminal 220. Each embodiment has advantages and disadvantages. If the account information and processing is done locally at the set top terminal 220, each set top terminal 220 must be provided with the memory and necessary processing capability to maintain the account. This greatly increases the cost of a set top terminal 220. If the account information is maintained remotely, the remote site must remain in regular contact with the set top terminal 220 in order to provide the subscriber with billing information.

Detailed Description Text (264):
To accommodate homes with multiple viewers two or more set top terminals 220 may be placed on a single bill or two accounts may be created for one set top terminal 220.

Detailed Description Text (272):
One of the primary tasks of the Operations Center 202 is, with assistance from the cable headends 208, effective utilization of available bandwidth from the Operations Center 202 to the subscriber homes. FIG. 14 shows effective allocation of 750 mHz of

bandwidth (1 mHz to 750 mHz) for television programming. In FIG. 14, bandwidth is allocated for both analog 226 and digitally compressed 227 signals. In the preferred embodiment, the bandwidth is divided so that each category of programs receives a portion of the bandwidth. These categories correspond with major menus of the set top terminal software. The representative categories shown in FIG. 14 include: (1) high definition TV (HDTV) made possible through the use of compression technology, (2) A La Carte Channel category which provides specialty channels for subscription periods such as monthly, and (3) pay-per-view.

Detailed Description Text (290):
FIGS. 19 through 21 depict sample menu screens produced by the set top terminal 220 using the program control information signal 276. FIG. 19 shows a menu which enables the viewer to select a program category or program service from among a choice of eight program categories. FIG. 20 shows a menu for the viewer to select a hit movie from among ten hit movies. FIG. 21 provides information about a movie (or event) and enables a viewer to order the movie for viewing.

Detailed Description Text (291):
FIGS. 19 through 21 show text generation by the set top terminal 220. This text is generated using information received via the program control information signal. FIG. 20 shows the text 380 generated for the hit movies major menu. In the preferred embodiment, text 380 such as that shown in FIGS. 19 through 21 is generated separately by a text generator (not shown) in the set top terminal unit 220. Those portions of the text that generally remain unchanged for a period of weeks or months may be stored in EEPROM or other local storage. For example, the text "HIT MOVIES from" 382 will consistently appear on each hit movies' major menu. This text may be stored on EEPROM or other local storage. Further, text such as that which appears at the lower center part of the screen "PRESS HERE TO RETURN TO CABLE TV" 384 appears many times throughout the menu sequence. This text may also be stored locally at the set top terminal 220. Text which changes on a regular basis, such as the movie titles (or other program selections), will be transmitted to the set top terminal 220 by either the operations center 202 or the cable headend 208. In this manner, the cable headend 208 may change the program selections available on any major menu modifying the program control information signal sent by the operations center 202 and transmitting the change. The network controller 214 of the cable headend 208 generally modifies the program control information signal and transmits the set top terminal control information signal (STTCIS). It is preferred that the text 380 is generated by the set top terminal 220 separately from the graphics because the text can be stored locally in a more compact manner requiring less storage space at the set top terminal 220. In addition, it allows for easy communication of text changes from the operations center 202 or cable headend 208 to the set top terminal 220.

Detailed Description Text (292):
FIGS. 19 through 21 show the use of day, date and time 386 information on menus. This information may be obtained in a variety of ways. The day, date, and time information 386 may be sent from the operations center 202, the cable headend 208 (signal processor or network controller 214), the uplink site, or generated by the set top terminal unit 220 internally. Each manner of generating the day, date, and time information 386 has advantages and disadvantages which may change given the particular embodiment and costs. In the preferred embodiment, the day, date, and time 386 are generated at a central location such as the operations center 202 and are adjusted for regional changes in time at the cable headend 208.

Detailed Description Text (293):
In order for the set top terminal 220 to generate submenus for subcategories of categories shown in FIG. 19 (which relate to the content of the programs), and to generate menus for movies such as FIG. 21, the terminal must receive information on the content of the programs from the Operations Center 202 (via the cable headend 208). Normally the set top terminal 220 would receive this information in the form of the program control information signal (or STTCIS). As shown FIG. 21, in addition to the text needed for these program menus, video or program scenes are also necessary.

Detailed Description Text (295):
Live video for menus, promos or demos may be sent to the set top terminal 220 in

several ways: a) on a dedicated channel, b) on a regular program channel and scaled to size, c) sent along with the program control information signal, etc. However, in the preferred embodiment, a great deal of short promos or demo video are sent using a split screen technique on a dedicated channel.

Detailed Description Text (296):
Using a split screen technique, any number of different video clips may be sent (e.g., 2, 4, 6, or 8 video clips). To show the video clip on a menu, the video must either be scaled and redirected to a video window on a menu screen or a masking methodology can be used. Masking involves playing the entire channel of video (all 2, 4, 6, or 8 split screens) in background and masking the unwanted video clip portions of the split screen by playing the menu in foreground and overlaying the unwanted background video. Masking is the least expensive method because it does not require any special hardware and it increases video throughput to the set top terminal 220. However, using the masking technique without any video redirecting causes each video clip to be located in a different position on the screen. It also requires the masking to be different for each video clip and makes consistent format difficult. On the other hand, scaling and redirecting video is generally difficult, expensive and requires additional hardware.

Detailed Description Text (297):
In order for the Operations Center 202 to prepare the promo video signal to be sent to the set top terminal 220, the Operations Center 202 must first identify the duration and actual video cut to be used for each promo and its position within the promo video signal. This information is maintained within the Operations Center 202 database. When it is time to produce the promo video signal (either to tape or to broadcast), each promo cut is scaled, positioned and combined with the other promos to form the single promo video signal. This is performed by readily available commercial equipment. Each promo is run repeatedly while the promo video signal is being generated. The audio signals of the individual promo cuts may be combined into the promo video signal audio tracks based upon the number of audio tracks available. The mapping of the audio tracks to the promos is also stored in the Operations Center database. Additionally, the mapping of promos to the programs that they are previewing is also stored in the Operations Center database. All promo database data is made available to the set top terminal 220 through the STTCIS.

Detailed Description Text (298):
In the preferred embodiment, the Operations Center 202 transmits six video/graphic promos for advertising purposes all on one channel. The throughput of the video/graphics on a single channel can be increased through the use of digital compression techniques. The set top terminal 220 uses either video scaling and redirecting techniques or masking to utilize the six video scenes. Although the set top terminal 220 actually performs the manipulation of video as necessary to generate the "live" menus for the subscriber, the appropriately prepared video signals must be formed and sent by the Operations Center 202 to the set top terminal 220.

Detailed Description Text (299):
If a promo for a given program is available at the set top terminal 220, the viewer may command the set top terminal 220 to display the promo. Generally, this is done through program selection from a menu screen by the subscriber. The selected program is referenced to information about available promos and allows the set top terminal 220 to tune to the proper channel, select the appropriate menu overlay mask based on the promos position and switch on the audio track(s) if they are available. The promos position on the screen dictates the displaying of the "live" text (refer to the video window of FIG. 21). The program associated with the currently selected promo may be purchased from this menu screen. Events, services and slices of time may be purchased from promotional menus.

Detailed Description Text (301):
In order to limit the amount of bandwidth needed to transmit the program control information signal, various compression techniques employed for non-video may be used such as block coding, contour coding, blob encoding, and run-length encoding. Further, the program control information signal may be divided into text and graphics, or video, text and graphics and then recombined at the set top terminal

220 using a text generator, graphics decompression, and video decompression as
necessary.

Detailed Description Text (307):
In another alternative configuration, in regions or areas without cable services,
where subscribers might use backyard satellite systems (TV RO) to receive packaged
television services, the set top terminal 220 will include the appropriate hardware
to allow connection to the backyard satellite reception equipment, i.e., a typical
communication port. In this configuration, the backyard satellite system will
receive programming signals originating from the Operations Center 202 directly from
the satellite transponders. No cable headend 208 is utilized with a backyard
satellite system. The menu system within the set top terminal 220 will be programmed
directly from the Operations Center 202. The Operations Center program signals and
control signals arrive at the set top terminal 220 essentially unchanged.
Additionally, in this configuration, an upstream communication mechanism must be in
place at the subscriber's home (e.g., modem) to communicate information to the
Operations Center 202 such as program ordering information. The set top terminals
220 can be equipped with a modem port for this upstream communication to the
Operations Center 202. The two alternative embodiments described in the preceding
four paragraphs, and other such embodiments not specifically referred to herein but
within the understanding of those skilled in the art, incorporate or combine one or
more of the components of the system 200 of the present invention.

Current US Original Classification (1):
725/109

Current US Cross Reference Classification (1):
725/37

Current US Cross Reference Classification (2):
725/91

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DOCUMENT-IDENTIFIER: US 6584153 B1
TITLE: Data structure and methods for providing an interactive program guide

Brief Summary Text (7):
An interactive digital video on demand (VOD) service known as the DIVA system is
manufactured by DIVA Systems Corporation of Menlo Park, Calif. The DIVA system
distributes audio-visual information to individual subscribers utilizing MPEG-like
information streams. DIVA subscribers utilize intelligent set top terminals (STT).

Brief Summary Text (8):
Unfortunately, the existing program guides have several drawbacks. They tend to
require a lot of memory, some of them needing upwards of one megabyte of set top
terminal memory. They are typically very slow to acquire their current database when
they are turned on for the first time or are subsequently restarted (e.g., a large
database may be downloaded to a set top terminal using only a vertical blanking
interval (VBI) data insertion technique). Disadvantageously, such slow database
acquisition may result in out of date database information or, in the case of a pay
per view (PPV) or video on demand (VOD) system, limited scheduling flexibility for
the information provider. Additionally, the user interface to existing program
guides does not usually look like a typical television control interface; rather the
user interface looks like a 1980s style computer display (i.e., blocky, ill-formed
text and/or graphics).

Detailed Description Text (3):
The invention will be described within the context of an interactive information
distribution system, illustratively the DIVA interactive digital video on demand
(VOD) system. However, it will be readily apparent to those skilled in the art that
the teachings of the present invention may be advantageously utilized in other
interactive video information distribution systems.

Detailed Description Text (7):
Upon receiving a "select" entry from the remote control unit, the set top terminal
transmits, via a back channel, the information that identifies the selected object
to the head end. It is important to note that changing the emphasis of an object or
element is performed entirely at the local level. That is, there is no change in the
actual video information transmitted by the head end to the subscriber. Only the
graphical overlay layer on the display is changed.

Detailed Description Text (56):
Channel options in the Interactive Program Guide can represent any combination of
programming offered from a wide range of sources, including but not limited to,
over-the-air broadcast, cable broadcast, satellite broadcast, local programming, ad
insertion apparatus and can include the full range of pay channels, pay per view,
video on demand, near video on demand, internet service, interactive gaming,
interactive shopping, free programming, etc. Channel numbers can be virtual in
nature, and they can be remapped in either the set top box or the head end equipment
to correspond to the service being delivered.

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L18: Entry 1 of 1   File: PGPB   Aug 14, 2003

DOCUMENT-IDENTIFIER: US 20030154474 A1
TITLE: Method and apparatus for performing session based conditional access

Abstract Paragraph (1):
A video-on-demand conditional access information distribution system includes establishing a session with a set top terminal by defining an in-band communications channel for transporting content to the set top terminal, and communicating to the set top terminal via the defined in-band communications channel, an authorization message and descrambling message suitable for determining a descrambling key for descrambling a program stream. The set top terminal sends a request for content via an out of band communications channel and a scrambled program stream is provided to the set top terminal via the defined in-band communications channel. The authorization message is sent prior to the set top terminal receiving the descrambling message and the scrambled program stream, which includes video-on-demand content requested by the set top terminal.

Summary of Invention Paragraph (13):
[0012] Specifically, a video-on-demand conditional access information distribution system includes establishing a session with a set top terminal by defining an in-band communications channel for transporting content to the set top terminal, and communicating to the set top terminal via the defined in-band communications channel, an authorization message and descrambling message suitable for determining a descrambling key for descrambling a program stream. The set top terminal sends a request for content via an out of band communications channel and a scrambled program stream is provided to the set top terminal via the defined in-band communications channel. The authorization message is sent prior to the set top terminal receiving the descrambling message and the scrambled program stream, which includes video-on-demand content requested by the set top terminal.

Detail Description Paragraph (18):
[0033] Specifically, FIG. 2 depicts a block diagram of an exemplary embodiment of the set top terminal 136 interactive information distribution system of FIG. 1. The STT 136 of FIG. 2 comprises a transceiver 200, a central processing unit (CPU) 212 and a display driver 222. The CPU 212 is supported by random access memory (RAM) 220, read only memory (ROM) 218 and various support circuits 216 such as clocks, power supply, an infrared receiver and the like. The transceiver 200 contains a diplexer 202, a back channel transmitter 208, an information channel receiver 204, a conditional access module 205, a command channel receiver 210 and an transport demultiplexer and decoder 206. The diplexer 202 couples the three channels carried by a single cable within the network to the transmitter and receivers.

Detail Description Paragraph (25):
[0040] Session control commands are implemented by the session controller 145 and not the set top terminal 136 alone. Each command is implemented by the execution of an applet by the set top terminal 136. The applet is transmitted to the STT by the session manager in response to, e.g., back channel requests transmitted by the STT. The applets control both information sessions, e.g., the presentation of video to the television screen, and navigator functions, e.g., the menus that facilitate selection of a video program. As such, particular commands include, but are not limited to, information or menu navigation commands, movie start at beginning, movie start at the middle, play, stop, rewind, forward, pause, and the like. These

presentation and navigation control commands are sent via a back channel transmitter
208 using binary phase shift key (BPSK) modulation.

CLAIMS:

1. In a video-on-demand conditional access information distribution system, a
computer readable medium in a general purpose computer system that operates as a
special purpose controller when executing at least one program for providing
video-on-demand content, comprising: establishing a session with a set top terminal
including defining an in-band communications channel for transporting content to
said set top terminal; communicating to said set top terminal via said defined
in-band communications channel, an authorization message and descrambling message
suitable for determining a descrambling key for descrambling a program stream;
receiving from said set top terminal a request for content via an out of band
communications channel; scrambling said program stream provided to said set top
terminal via said defined in-band communications channel; sending said authorization
message prior to said set top terminal receiving said descrambling message and said
scrambled program stream; and including, within said program stream being scrambled,
video-on-demand content requested by said set top terminal.

7. In a video-on-demand conditional access information distribution system
comprising provider equipment for providing video-on-demand programs to subscribers
via an in-band communications channel, a method comprising the steps of:
establishing a session with a set top terminal including defining the in-band
communications channel for transporting content to said set top terminal;
communicating to said set top terminal, via said defined in-band communications
channel, an authorization message and descrambling message suitable for determining
a descrambling key for descrambling said program stream; scrambling said program
stream provided to a set top terminal via said defined in-band communications
channel; sending, prior to said set top terminal receiving said descrambling message
and said scrambled program stream, said authorization message; and including, within
said program stream being scrambled, video-on-demand content requested by said set
top terminal.

19. A method for providing session-based conditional access to video-on-demand
content, comprising the steps of: establishing a session with a set top terminal
including defining an in-band communications channel for transporting content to
said set top terminal scrambling a program stream provided to said set top terminal
via said defined in-band communications channel; communicating to said set top
terminal, via said defined in-band communications channel, an authorization message
and descrambling message suitable for determining a descrambling key for
descrambling said program stream, wherein said authorization message is sent prior
to said set top terminal receiving said descrambling message and said scrambled
program stream; and including, within said program stream being scrambled,
video-on-demand content requested by said set top terminal.

Hybrid Instrument Transaction Service, Hybrid Instrument Service, cir. 1995.

Other Reference Publication (21):
"Hybrid Instrument Transation Service (HITS) Overview", Hybrid Instrument Service,
Circa 1995, 6 pages.